What is claimed is:

1. A method for processing bit symbols generated by a data source, in particular a video, still image or audio source, comprising the following steps:

constructing a plurality of bit-planes using the bit symbols generated by the data source, each bit-plane comprising a plurality of bit-plane symbols;

scanning the bit-plane symbols of each bit-plane to generate a binary string of bit-plane symbols;

encoding the binary string of the bit-plane symbols using a statistical model, wherein the statistical model is based on statistical properties of a Laplacian probability distribution function which characterizes the data source, wherein the Laplacian probability distribution function is defined by

$$f(x)=\frac{e^{-|x|\sqrt{\frac{2}{\sigma^2}}}}{\sqrt{2\sigma^2}}$$

wherein σ is the standard deviation of the Laplacian probability distribution function.

2. The method according to claim 1, wherein the encoding of the binary string of bit-plane symbols is performed by an entropy encoder.

3. The method according to claim 2, wherein an arithmetic encoder is used as the entropy encoder.

4. The method according to claim 1, wherein a probability assignment to each bit-plane symbol is determined based on the Laplacian probability distribution function and is used to determine the statistical model for encoding the binary string of bit-plane symbols.

5. The method according to claim 4, wherein the probability assignment to the bit-plane symbol is determined by

$$P_j = 1 - \left(1 + e^{-2^j \sqrt{\frac{2}{\sigma^2}}}\right)^{-1} \qquad , j = M-1,\ M-2,\ \ldots$$

wherein

P_j is the probability assignment to the bit-plane symbol, and
j is the bit-plane.

6. The method according to claim 1, wherein a probability assignment to each bit-plane symbol is determined based on previously encoded bit-plane symbols.

7. The method according to claim 6, wherein the probability assignment to the bit-plane symbol is determined by

$$P_j = \frac{N_a}{N} P_j^{N_a} + \left(1 - \frac{N_a}{N}\right) P_j^{ML}$$

wherein

P_j is the probability assignment to the current bit-plane symbol,

j is the bit-plane,

N_a is the number of bit-plane symbols coded until the end of the previous bit-plane,

N is the number of bit-plane symbols coded until the current bit-plane symbol,

P_j^{Na} is the estimation of P_j after observing N_a bit-plane symbols,

P_j^{ML} is the maximum likelihood estimation of P_j for the current bit-plane and is defined by

$$P_j^{ML} = \frac{\sum_{j=1}^{N-N_a} b_{i,j}}{N - N_a}$$

wherein $b_{i,j}$ is the bit-plane symbol.

8. The method according to claim 7, wherein the estimation of P_j after observing N_a bit-plane symbols, P_j^{Na}, is updated by

$$P_j^{N_a} = \frac{\sqrt{P_{j+1}^{N_a}}}{\sqrt{1 - P_{j+1}^{N_a}} + \sqrt{P_{j+1}^{N_a}}}$$

wherein $P_{j+1}^{N_a}$ is the estimation of P_j from the previous bit-plane.

9. The method according to claim 1, further comprising the following steps:

determining an optimal bit-plane from the plurality of constructed bit-planes;

determining a probability assignment to each bit-plane based on its relation to the optimal bit-plane;

wherein the probability assignment to the bit-plane is used as the statistical model for encoding the binary string of bit-plane symbols.

10. The method according to claim 9, wherein the optimal bit-plane is determined by determining an integer which best satisfies

$$\phi^{2^{-L+1}} \leq \theta < \phi^{2^{-L}}$$

wherein

L is the integer representing the optimal bit-plane,

ϕ is defined by $\left(\frac{\sqrt{5}-1}{2}\right)$,

θ is defined as

$$\theta \overset{\Delta}{=} e^{\sqrt{\frac{2}{\sigma^2}}}$$

11. The method according to claim 10, wherein the probability assignment the bit-plane is determined by

$$Q_j^L = \begin{cases} \frac{1}{1+2^{2^{j-L}}}, j \geq L \\ \frac{1}{2}, j < L \end{cases}$$

wherein

Q_j^L is the probability assignment of the j^{th} bit-plane.

12. The method according to claim 10, wherein the probability assignment to the bit-plane is determined by

$$Q_j^L = \begin{cases} \frac{1}{2^{2^{j-L}}}, j \geq L \\ \frac{1}{2}, j < L \end{cases}$$

wherein

Q_j^L is the probability assignment of the j^{th} bit-plane.

13. The method according to claims 5 or 7, further comprising the following steps:

decoding the encoded binary string of bit-plane symbols using a further statistical model to generate a further binary string of bit-plane symbols,

re-constructing a plurality of bit-planes comprising the bit-plane symbols using the further binary string of bit-plane symbols, wherein the further statistical model

is based on statistical properties of a Laplacian probability distribution function which characterizes the bit-plane symbols of the reconstructed bit-planes.

14. The method according to claim 13, wherein the data source is re-constructed from the bit-planes by

$$\hat{x}_i = (2s_i - 1)\left(\sum_{j=M-1}^{T} b_{i,j} 2^j + \sum_{j=T-1}^{-\infty} P_j 2^j\right),$$

wherein

$\hat{x}_i$ is the re-constructed data source,

s_i is a sign symbol of $\hat{x}_i$,

$b_{i,j}$ is the bit-plane symbol, and

T is the bit-plane the encoded binary string of bit-plane symbols is terminated.

15. The method according to claims 11 or 12, further comprising the following steps:

decoding the encoded binary string of bit-plane symbols using a further statistical model to generate a further binary string of bit-plane symbols,

re-constructing a plurality of bit-planes comprising the bit-plane symbols using the further binary string of bit-plane symbols, wherein the further statistical model is based on statistical properties of a Laplacian probability distribution function which characterizes the bit-plane symbols of the reconstructed bit-planes.

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16. The method according to claim 15, wherein the data source is re-constructed from the bit-planes by

$$\hat{x}_l = (2s_l - 1)\left(\sum_{j=M-1}^{T} b_{l,j} 2^j + \sum_{j=T-1}^{-\infty} Q_j^L 2^j\right)$$

wherein

$\hat{x}_l$ is the re-constructed data source,
s_l is a sign symbol of $\hat{x}_l$,
$b_{l,j}$ is the bit-plane symbol, and
T is the bit-plane the encoded binary string of bit-plane symbols is terminated.

17. A device for processing bit symbols generated by a data source , in particular a video, still image or audio source, comprising:

a bit-plane construction unit for constructing a plurality of bit-planes from the data source, each bit-plane comprising a plurality of bit-plane symbols, and scanning the bit-plane symbols of each bit-plane to generate a binary string of bit-plane symbols,

a statistical model unit for providing statistical information based on statistical properties of a Laplacian probability distribution function which characterizes the data source, wherein the Laplacian probability distribution function is defined by

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$$f(x) = \frac{e^{-|x|\sqrt{\frac{2}{\sigma^2}}}}{\sqrt{2\sigma^2}}$$

wherein σ is the standard deviation of the Laplacian probability distribution function and

an encoding unit for encoding the binary string of bit-plane symbols based on the statistical information provided by the statistical model unit.

18. A computer readable medium, having a program recorded thereon, wherein the program is to make the computer execute a procedure for processing bit symbols by a data source, comprising the following steps:

constructing a plurality of bit-planes using the bit symbols generated by the data source, each bit-plane comprising a plurality of bit-plane symbols;

scanning the bit-plane symbols of each bit-plane to generate a binary string of bit-plane symbols;

encoding the binary string of the bit-plane symbols using a statistical model, wherein the statistical model is based on statistical properties of a Laplacian probability distribution function which characterizes the data source, wherein the Laplacian probability distribution function is defined by

$$f(x) = \frac{e^{-|x|\sqrt{\frac{2}{\sigma^2}}}}{\sqrt{2\sigma^2}}$$

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wherein σ is the standard deviation of the Laplacian probability distribution function.

19. A computer program element which is to make the computer execute a procedure for processing bit symbols generated by a data source, comprising the following steps:

constructing a plurality of bit-planes using the bit symbols generated by the data source, each bit-plane comprising a plurality of bit-plane symbols;

scanning the bit-plane symbols of each bit-plane to generate a binary string of bit-plane symbols;

encoding the binary string of the bit-plane symbols using a statistical model, wherein the statistical model is based on statistical properties of a Laplacian probability distribution function which characterizes the data source, wherein the data source has a form of a Laplacian probability distribution function, wherein the Laplacian probability distribution function is defined by

$$f(x) = \frac{e^{-|x|\sqrt{\frac{2}{\sigma^2}}}}{\sqrt{2\sigma^2}}$$

wherein σ is the standard deviation of the Laplacian probability distribution function.